



# Australian Bureau of Statistics

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### Feature Article - Updating the Experimental Composite Leading Indicator of the Australian Business Cycle: September Quarter 2002

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#### BACKGROUND

The ABS Experimental Composite Leading Indicator (XCLI) is a single time series designed to provide early signals of turning points in the Australian business cycle. It does not predict the level of GDP or signal recessions or recoveries.

The XCLI has been developed to supplement rather than to compete with existing forms of economic analysis and forecasting. It is published each quarter in Australian Economic Indicators (in the March, June, September and December issues).

#### RECENT PERFORMANCE

Past performance of the XCLI shows it led turning points in the business cycle by between one and six quarters, with the average being around two quarters. However the XCLI has not been performing well recently, with the lead time between movements in the XCLI, and the GDP business cycle steadily declining (See page 5 for more details).

#### MOST RECENT MOVEMENTS

In the September quarter 2002, the XCLI declined for the second quarter (down 0.26 to -0.05). The XCLI showed a provisional turning point at March quarter 2002. Based on historical performance a peak in the GDP business cycle may be expected to emerge several quarters later.

Although it has known problems, the XCLI is signaling a forthcoming downturn in the GDP business cycle. Only three of eight component indicators are making a positive contribution.

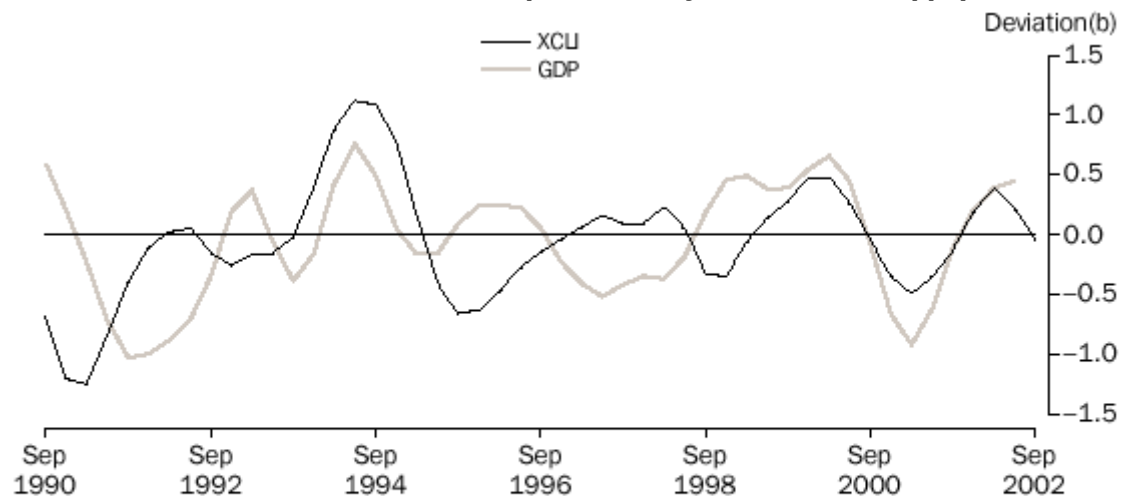
In the September quarter 2002, the series that gave the largest positive contribution was Job Vacancies (0.12) while the largest negative contribution to the change in the XCLI came from the Real Interest Rate series (-0.28).

The growth in GDP trend slowed continually from the December quarter 1999 (when it grew by 1.0%) to the December quarter 2000 (0.2%). This was followed by GDP growth for three consecutive quarters at an increasing rate, reaching growth of 1.3% in the September quarter 2001. Since then the quarterly growth rate slowed continually, with growth of 0.7% in the June quarter 2002. The growth of the historical long-term trend was 0.6% in the June quarter 2002.

This rate of growth has been slowing since the peak of 1.2% in December quarter 1997.

## 1. EXPERIMENTAL COMPOSITE LEADING INDICATOR (XCLI) AND ITS TARGET, THE BUSINESS CYCLE IN GDP

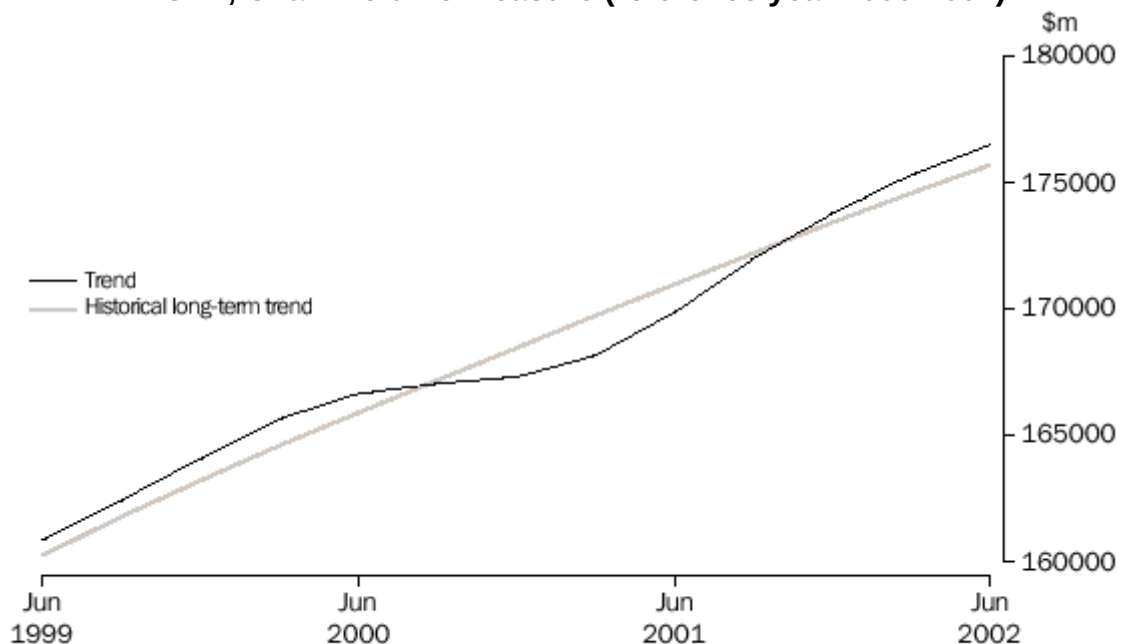
### Chain volume measure (reference year 2000-2001)( a)



(a) In the June quarter 2002, the historical long-term trend growth rate of GDP is 0.63% and the trend growth rate is 0.68%.

(b) Deviation is the unit of measure for the GDP series and it refers to the deviation of trend from its historical long-term trend. The XCLI series has no official unit of measure, ie it is dimensionless. (see Endnote).

## 2. GDP, Chain volume measure (reference year 2000-2001)



Source: ABS (Cat. no. 5206.0), Quarterly data

**Table 1: XCLI and GDP Chain Volume Measure (Reference year 2000-2001)**

	Jun 2001	Sep 2001	Dec 2001	Mar 2002	Jun 2002	Sep 2002
Level						
XCLI	-0.35	-0.13	0.18	0.38	0.21	-0.05
GDP Trend (\$m)	169,888	172,010	173,773	175,238	176,438	n.a.
GDP Long-term trend (\$m)	170,955	172,198	173,405	175,556	175,653	n.a.
GDP Business cycle	-0.62	-0.11	0.21	0.39	0.45	n.a.

Movement from previous quarter						
XCLI (change)	0.13	0.22	0.32	0.20	-0.17	-0.26
GDP Trend (% change)	1.04	1.25	1.02	0.84	0.68	n.a.
GDP Long-term trend (% change)	0.74	0.73	0.70	0.66	0.63	n.a.
GDP Business cycle (change)	0.30	0.52	0.32	0.18	0.06	n.a.

**Table 2: Contributions to quarterly changes in the XCLI**

	Jun 2001	Sep 2001	Dec 2001	Mar 2002	Jun 2002	Sep 2002
Trade factor	0.01	0.00	0.05	0.11	0.04	-0.05
United States GDP	-0.14	-0.08	0.01	0.07	0.07	0.06
Housing Finance Commitments	0.14	0.08	-0.01	-0.05	-0.02	-0.01
Job Vacancies	-0.13	-0.08	-0.01	0.06	0.11	0.12
S&P/ASX 200 Industrials index	0.01	-0.06	-0.01	0.03	-0.10	-0.14
Real interest rate (inverse lagged four quarters)	0.26	0.32	0.16	-0.16	-0.37	-0.28
Production expectations (lagged one quarter)	-0.08	0.01	0.09	0.12	0.08	0.01
Business expectations (lagged one quarter)	0.05	0.04	0.03	0.02	0.02	0.02
Total XCLI, change from previous quarter	0.13	0.22	0.32	0.20	-0.17	-0.26

## THE REFERENCE SERIES, GDP

The reference or target series for the XCLI is the GDP business cycle in Australia. The business cycle of a series is defined as the deviation between the trend and the historical long-term trend in the series. Graph 1 shows the business cycles in GDP and the XCLI. Graph 2 shows the level of trend GDP compared with its historical long-term trend. When the trend is below the historical long term trend the GDP business cycle shown in Graph 1 is negative.

## TURNING POINTS THE XCLI HAS HAD TROUBLE PREDICTING

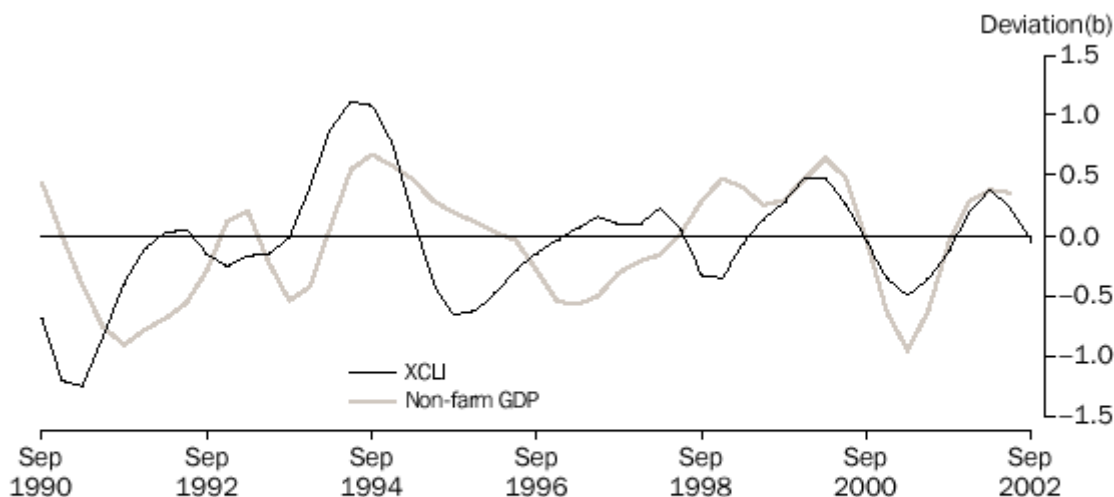
In the December quarter 1995, there was a peak in the business cycle which the XCLI failed to predict. This peak was largely attributable to the effects of a good farm season. The current drought is expected to have the opposite effect by depressing GDP growth. The XCLI does not contain an indicator which leads first order farm product effects. In recognition of this, Graph 3 presents an alternative target series, namely, the business cycle of non-farm GDP, chain volume measure.

The XCLI peaked in the March quarter 2002. Based on historical performance, the non-farm GDP business cycle may have been expected to peak two quarters later. However, the non-farm GDP business cycle is also showing a provisional peak in the March quarter 2002.

The XCLI has been experiencing a decline in the lead time of predicting turning points in the GDP business cycle. The past four turning points in the business cycle have been predicted by the XCLI but the lead time has been decreasing.

## 3. EXPERIMENTAL COMPOSITE LEADING INDICATOR (XCLI) AND, THE BUSINESS CYCLE IN NON-FARM GDP-

### Chain volume measure (reference year 2000-2001)(a)



(a) In the June quarter 2002, the historical long-term trend growth rate of non-farm GDP is 0.60% while the trend growth rate is 0.57%.

(b) Deviation is the unit of measure for the GDP series and it refers to the deviation of trend from its historical long-term trend. The XCLI series has no official unit of measure, ie it is dimensionless (see Endnote).

## ANALYSIS OF COMPONENT INDICATORS

The XCLI summarises the business cycles present in a selection of economic indicators which had typically shown turning points ahead of the business cycle in GDP from the early 1970s to the early 1990s. Because the evolution of each expansion and contraction in activity presents a unique combination of features, none of the individual component indicators has had an unvarying or perfectly stable leading relationship with GDP. However, when combined to form the XCLI their performance as a group is more stable.

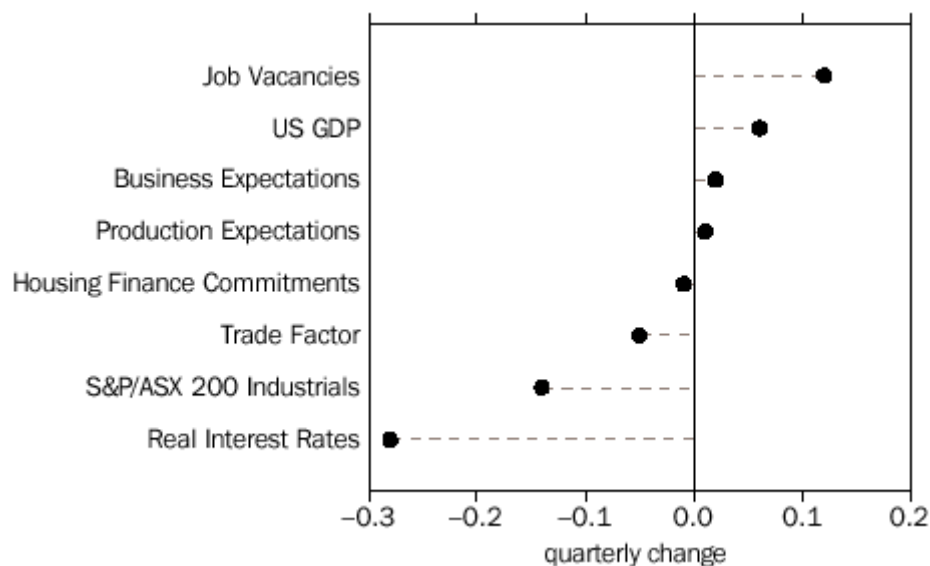
In the September quarter 2002, three of the eight components made positive contributions to the quarterly change in the XCLI, three made negative contributions and two made negligible contributions (Table 2 and Graph 4). The XCLI declined from the previous quarter. Graphs 5 to 12 show each component's trend and historical long-term trend.

**Positive contributions.** The components making significant positive contributions to the quarterly change in the September quarter 2002 XCLI were job vacancies (0.12, Graph 8), US GDP (0.06, Graph 6) and business expectations (0.02, Graph 12).

**Negative contributions.** The components making negative contributions to the quarterly change in the September quarter 2002 XCLI were the real interest rates (-0.28, Graph 10), S&P/ASX 200 Industrials index (-0.14, Graph 9) and trade factor (-0.05, Graph 5).

**Negligible contributions.** The components making negligible contributions to the quarterly change in the September quarter 2002 XCLI were production expectations (0.01, Graph 11), and housing finance commitments (-0.01, Graph 7).

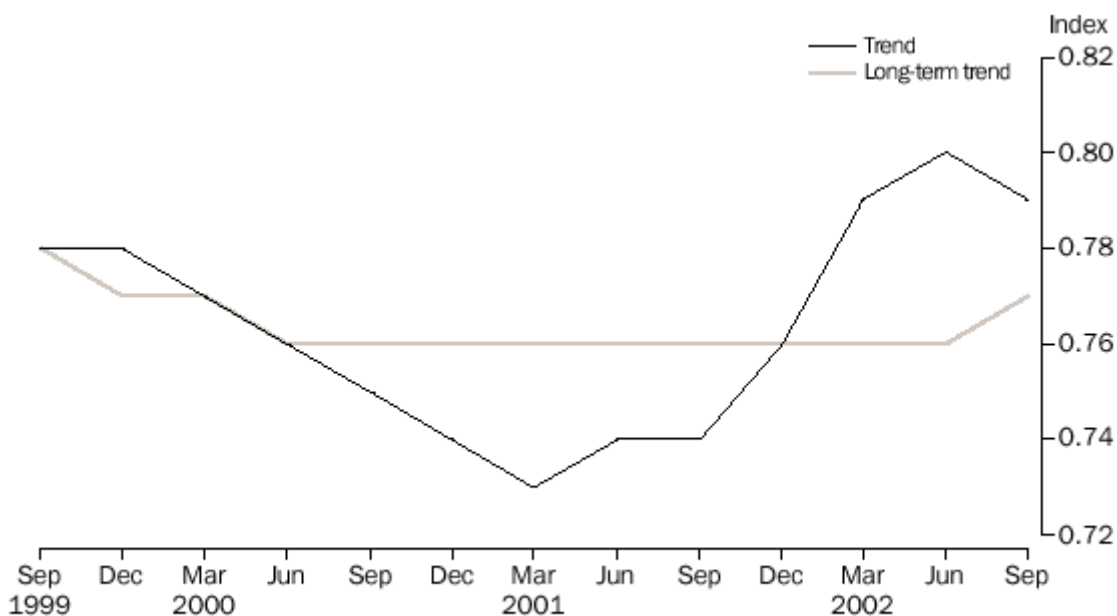
## 4. CONTRIBUTIONS TO QUARTERLY CHANGES IN THE XCLI



## Trade Factor

The trade factor is defined as the ratio between commodity prices in terms of Special Drawing Rights and the price index for imported materials used by Australian producers. This ratio gives an early indication of changes in the terms of trade. The trend of the trade factor has fallen slightly following five quarters of growth, while the long-term trend has risen slightly. The trade factor component made a negative contribution (-0.05) to the change in the XCLI in the September quarter 2002, following seven quarters of positive and negligible contributions.

## 5. TRADE FACTOR



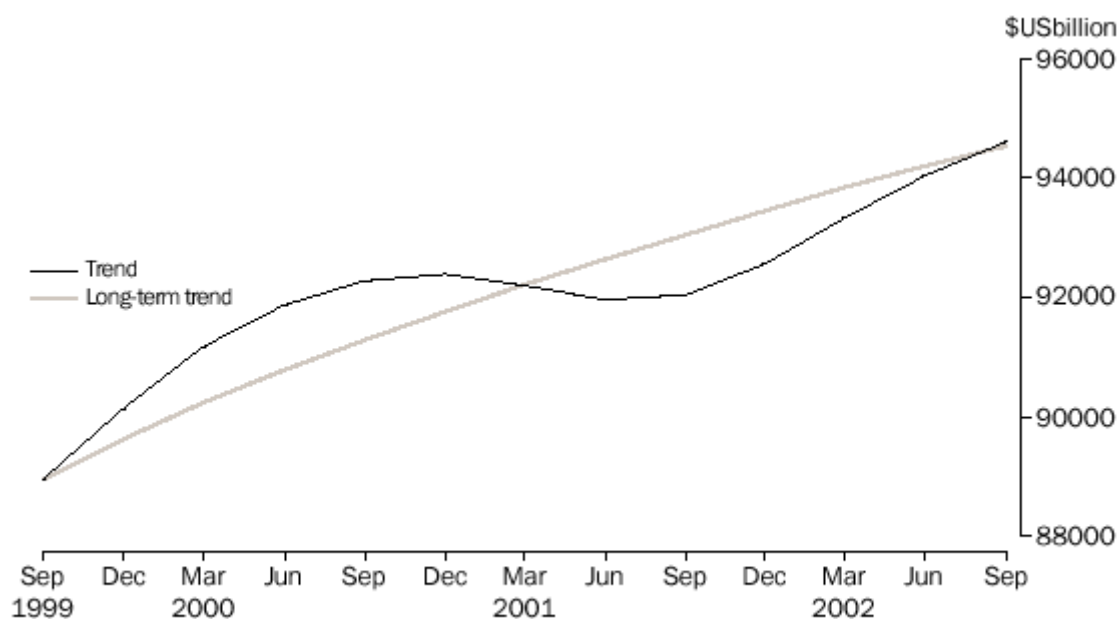
Source: ABS (Cat. no. 6411.0) and RBA Bulletin.

## United States GDP

The US GDP component made a positive contribution (0.05) to the change in the XCLI in the September quarter 2002. This is the fourth quarter of positive contributions. The trend of the United States GDP grew in the September quarter for the fifth consecutive quarter. The rate of

growth of the long-term trend has decelerated since the June quarter 1998 but the trend of the US GDP has only just risen above its long-term trend after falling below it in the March quarter 2001.

## 6. UNITED STATES GDP, Chain volume measure (Reference year 1996)



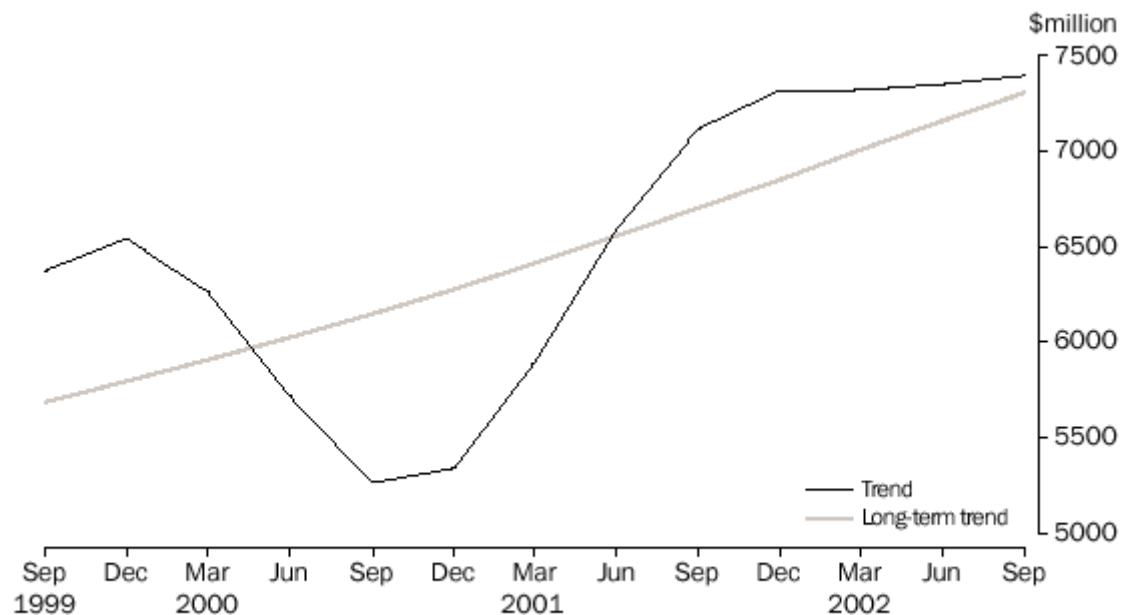
Source: US Bureau of Economic Analysis.

## Secured housing finance commitments

The trend of the secured housing finance commitments rose slightly in the September quarter 2002. The historical long-term trend for secured housing finance commitments also continued to rise.

The secured housing finance commitments component contributed negligibly (-0.01) to the change in the XCLI in the current quarter. This follows three quarters of negative contribution to the CLI.

## 7. SECURED HOUSING FINANCE COMMITMENTS

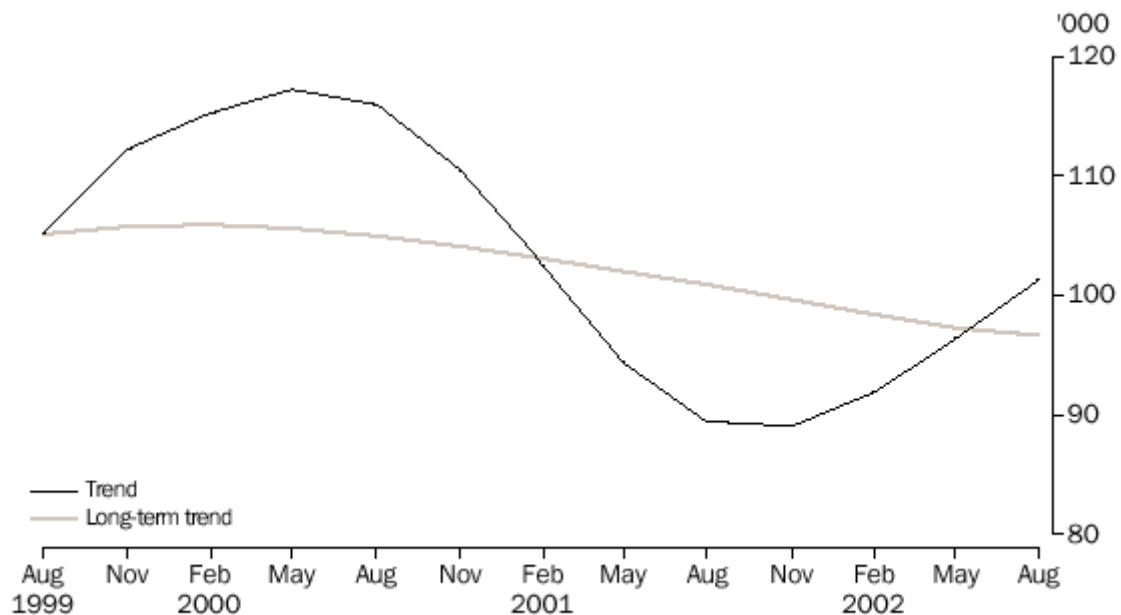


## Job Vacancies

**Note that the job vacancies series are referenced to the middle month of a quarter.**

The job vacancies trend rose in August 2002 (5.2%). This is the third quarterly rise in this series following six quarters of decline. The long-term trend has been falling for ten quarters but at a declining rate. In August 2002 it fell by -0.7%, following a fall in May 2002 (-1.1%). As a consequence job vacancies made a positive contribution (0.12) to the change in the XCLI in the September quarter 2002.

## 8. JOB VACANCIES

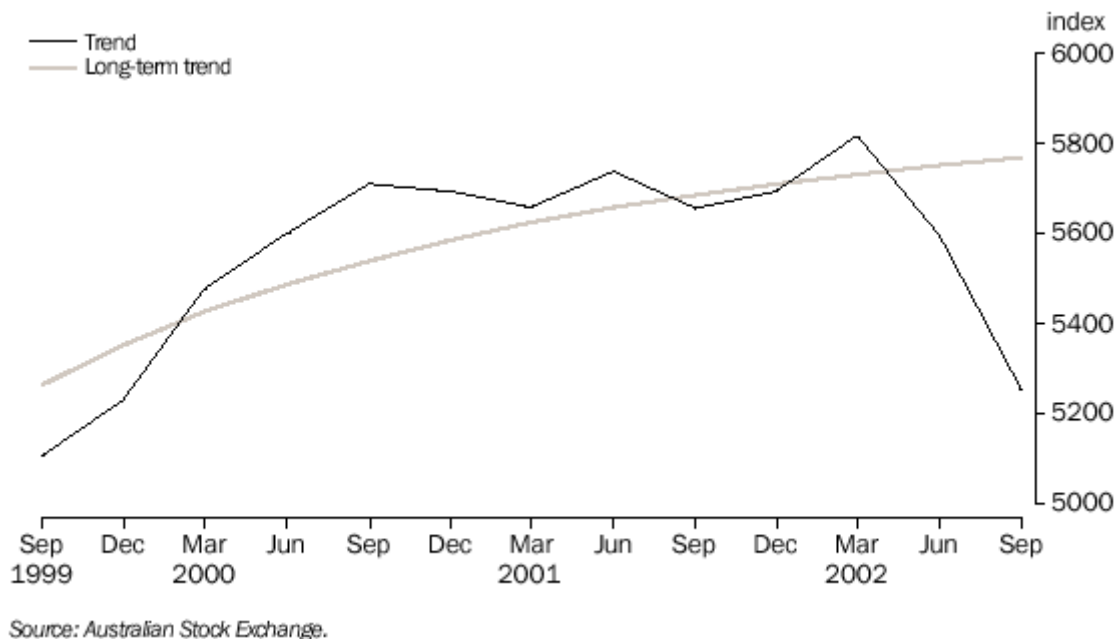


## S&P/ASX 200 Industrials index

In the September quarter 2002, the trend of the S&P/ASX 200 Industrials Index fell (-6.1%) and its long-term trend rose (0.3%). The long-term trend has been rising at a declining rate since June quarter 1997.

As the trend series is declining below the long-term trend and the long-term trend is rising, the S&P/ASX 200 Industrials Index made a negative contribution (-0.14) to the change in the XCLI in the September quarter 2002.

### 9. S&P/ASX 200 INDUSTRIALS INDEX



### Real interest rate

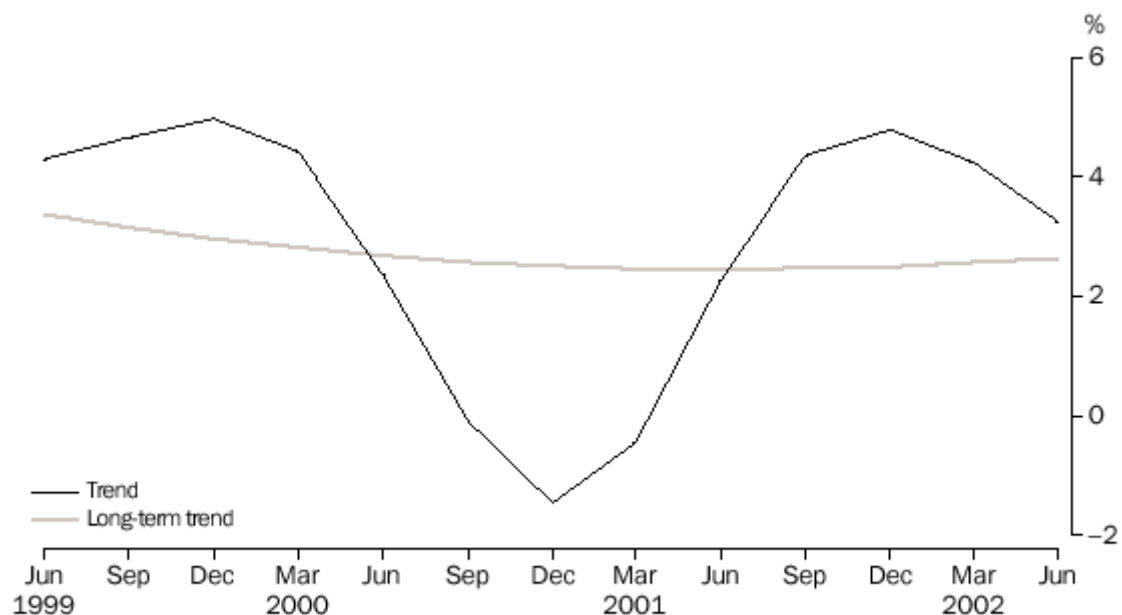
**Note: The real interest rate is defined as the difference between nominal interest rates and the change in the domestic final demand chain price index.**

The XCLI uses the inverse of the business cycle in the real interest rate, lagged four quarters. Therefore, it is the September quarter 2001 movement of the real interest rate that contributes to the September quarter 2002 movement in the XCLI. The real interest rate component made a negative contribution (-0.28) to the change in the XCLI in the September quarter 2002.

The trend of the real interest rate fell in the June quarter 2002 following a fall in the March quarter 2002. This movement follows a rise for four quarters in the series. The long-term trend rose following four quarters of rises.

It is the relative movements in the trend and long-term trend series in the September quarter 2001 that contribute to the September 2002 XCLI. The movements in the December quarter 2001 mean real interest rate component should make a negative contribution to the change in the December quarter 2002 XCLI however in the following quarters the component should make a positive contribution.

### 10. REAL INTEREST RATE



Source: ABS (Cat. no. 5206.0) and Treasury.

## Production and business expectations

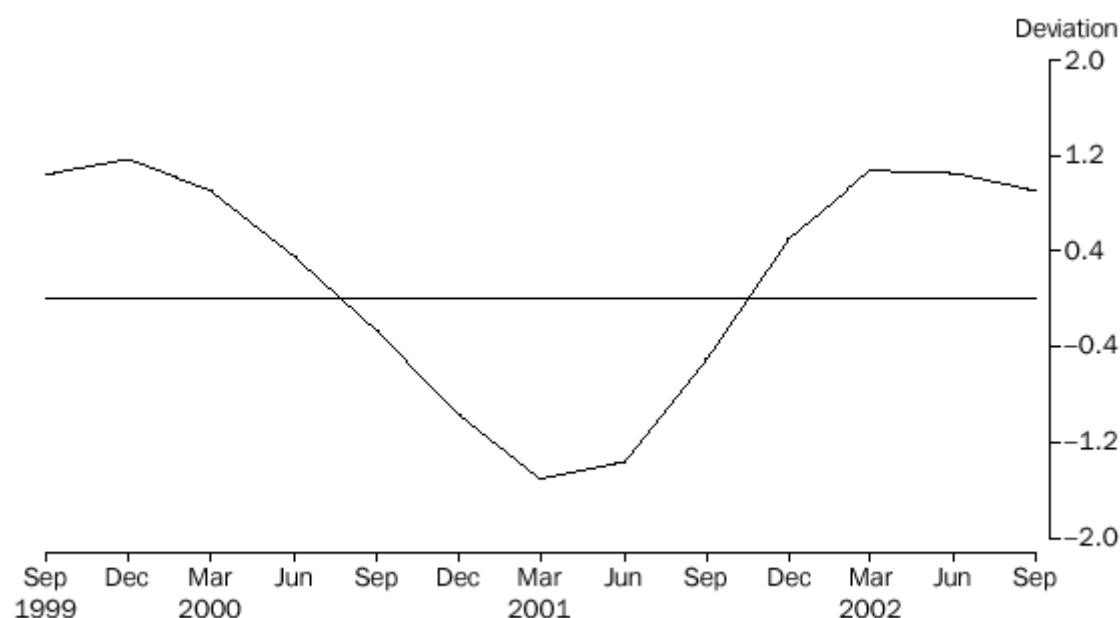
**Note:** These components are lagged one quarter in the compilation of the XCLI. Like other XCLI components, the production expectations and business expectations series have been smoothed and standardised to display cyclical behaviour. However, these series are not considered to exhibit long-term trend growth.

In the September quarter 2002, the trend of production expectations declined for the second quarter. This follows five quarters of rises. According to the Survey of Industrial Trends (produced by ACCI and Westpac Banking Corporation), production expectations in original terms were up in September quarter 2002. Because this component is lagged one quarter, it was the negligible movement in the June quarter 2002 that made a negligible contribution in the change in the XCLI in the September quarter 2002 (0.01). This component is expected to make a negative contribution for the December quarter 2002.

In the September quarter 2002, the trend of business expectations fell. This rise follows rises in the previous six quarters. According to the September quarter 2002 Survey of Industrial Trends there was a decline in business expectations in original terms. Because this component is lagged, it was the increase in business expectations in the June quarter 2002 that made a positive contribution to the change in the XCLI in the September quarter 2002 (0.02). This component is expected to make a negative contribution for the December quarter 2002.

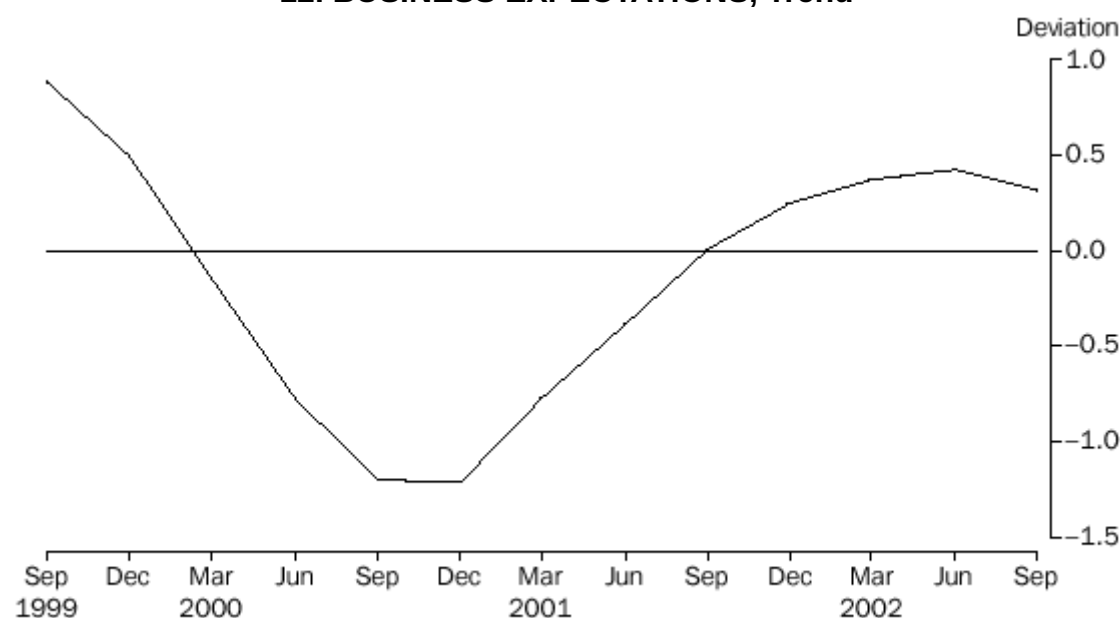
**Note:** The source of these expectations series is the Australian Chamber of Commerce and Industry, and Westpac Banking Corporation, Survey of Industrial Trends.

## 11. PRODUCTION EXPECTATIONS, Trend



Source: ACCI and Westpac Banking Corporation, 'Survey of Industrial Trends'.

## 12. BUSINESS EXPECTATIONS, Trend



Source: ACCI and Westpac Banking Corporation, 'Survey of Industrial Trends'.

## LONGER TIME SERIES AND FURTHER DETAILS

Details of the compilation of the XCLI index can be found in **An Experimental Composite Leading Indicator of Australian Economic Activity**, (ABS cat. no. 1347.0), released in June 1993, and in the feature articles published in **Australian Economic Indicators** (ABS cat. no. 1350.0) in August and October 1992 and May 1993.

Longer time series of the data presented in this XCLI article are available on AUSSTATS. For further information about these statistics please contact Jo Jackson on Canberra (02) 6252 6114.

## ENDNOTE

The unit of measurement varies between XCLI components. For example, the real interest rate is measured as a percentage, job vacancies as a number, United States GDP in dollar terms and the trade factor is measured in index number form. Each component is therefore standardised to make its contribution to the XCLI comparable.

The standardisation procedure gives each XCLI component an average value of 1. The variation of each component about its average is also standardised, so that the average deviation also equals 1. Chain volume GDP (the reference series) is also standardised in the same way.

Graphs 1 and 3 use the standardised forms of the XCLI, GDP and non-farm GDP series. The graphs show the deviation of the standardised series from their respective historical long-term trends. Because of the standardisation procedure, the deviation measure has no particular unit (i.e. it is not measured in dollars, or percentage change, or any other real world unit).

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